

Acquired Immunodeficiency

Syndrome (AIDS)

The first AIDS cases in Virginia were reported in December 1982, when a total of six cases were reported. Twenty-four cases were reported in 1983, 39 in 1984, 102 in 1985, 166 in 1986, and 270 in 1987 (Figure 1). Of the 376 cases reported during 1988, 196 (52.1%) are known to have died. A cumulative total of 983 AIDS cases have been reported as of the end of 1988 with 704 (71.6%) known to be dead.

REPORTED CASES OF AIDS IN VIRGINIA
BY VITAL STATUS AND REPORT YEAR

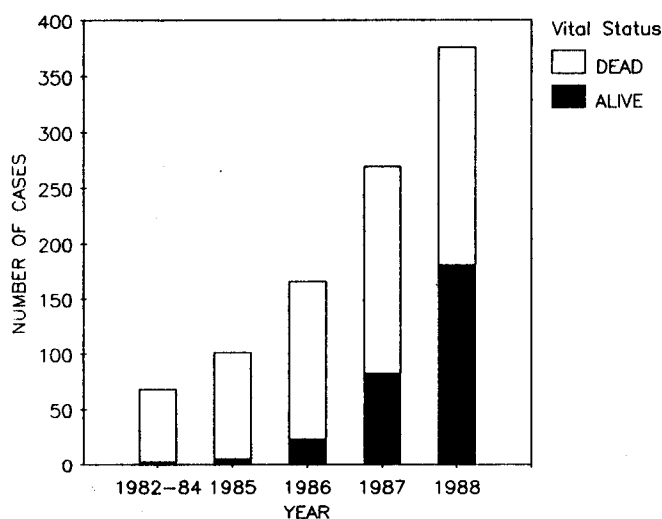


FIGURE 1

The Human Immunodeficiency Virus (HIV) which causes AIDS is a blood-borne virus. The most common routes of transmission are unprotected sexual intercourse (especially anal intercourse) and intravenous (IV) drug use. During 1988 the majority of AIDS cases indicated homosexual activity (64.4%) (Figure 2). The next largest transmission category was IV drug use

accounting for 15.2% of AIDS cases during 1988. A combination category of homosexual/IV drug

REPORTED CASES OF AIDS IN VIRGINIA
BY ROUTE OF TRANSMISSION, 1988

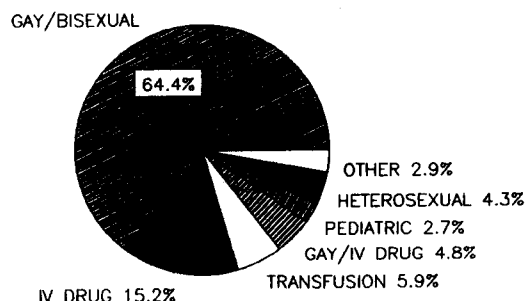


FIGURE 2

use contributed 4.8%. Although blood banks have been screening donated blood since March 1985, persons infected from transfusions prior to blood screening are now developing AIDS. During 1988, 22 (5.9%) transfusion-associated cases were reported. No AIDS cases resulting from transfusions of screened blood have been reported in Virginia.

The majority of AIDS cases occur during the ages of 20 to 49 (87.4% in 1988). During 1988, the age group with the highest percentage of reported cases was persons 30 to 39 years of age (45.7%) (Figure 3). Ten (2.7%) children under 13 years of age were reported with AIDS in 1988. The majority of these children (70%) were infected via perinatal transmission. Three children received blood products through transfusion or treatment for hemophilia.

During 1988, 56.9% (214 cases) were reported among whites. While 39.6% of the cases were reported among blacks, only approximately 25%

REPORTED CASES OF AIDS IN VIRGINIA BY AGE, 1988

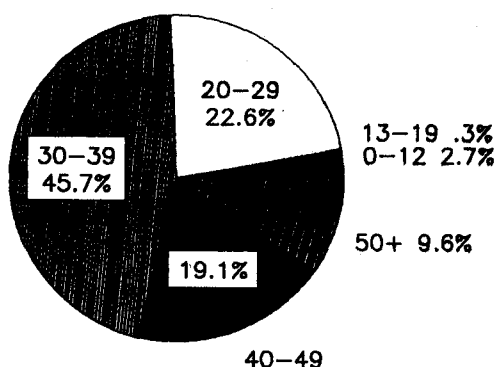


FIGURE 3

of the Virginia population is black. Therefore, blacks are disproportionately affected. In addition, 90.7% of the cases reported in 1988 were male (Figure 4).

REPORTED CASES OF AIDS IN VIRGINIA BY SEX, 1988

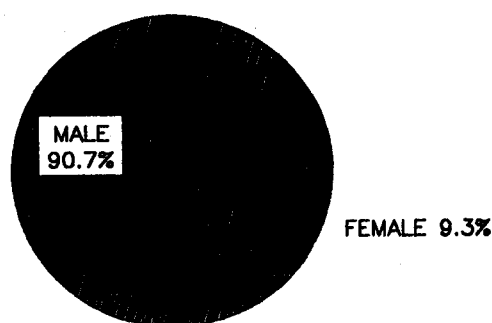


FIGURE 4

AIDS cases are primarily concentrated in Virginia's urban areas. Richmond City (14.6%)

and Fairfax County (13.0%) reported the highest percentage of cases during 1988.

On a regional level, the Northern Region reported the highest percentage of cases (35.1%), although this is lower than the 45.6% reported from this region in 1987. This area contributes the Virginia part of the District of Columbia's standard metropolitan statistical area (SMSA). The Eastern Region reported 28.7% of the cases with the majority of cases reported from the Norfolk (29.6%), Virginia Beach (19.4%), and Peninsula (18.5%) Health Districts. The Central Region reported 22.1% of the AIDS cases in 1988 with most of its morbidity in the Richmond City Health District (66.3%). The percentage reported from the Southwest Region in 1988 (6.9%) was similar to the 7.0% reported in 1987. The Northwest Region reported 7.2% of the cases in 1988, double the percentage reported from this region in 1987 (3.3%).

Persons with AIDS develop a variety of life-threatening opportunistic infections due to immunosuppression. The most commonly diagnosed infection is Pneumocystis carinii

OPPORTUNISTIC INFECTIONS EXPERIENCED BY AIDS PATIENTS BY REPORT YEAR, VIRGINIA, 1988

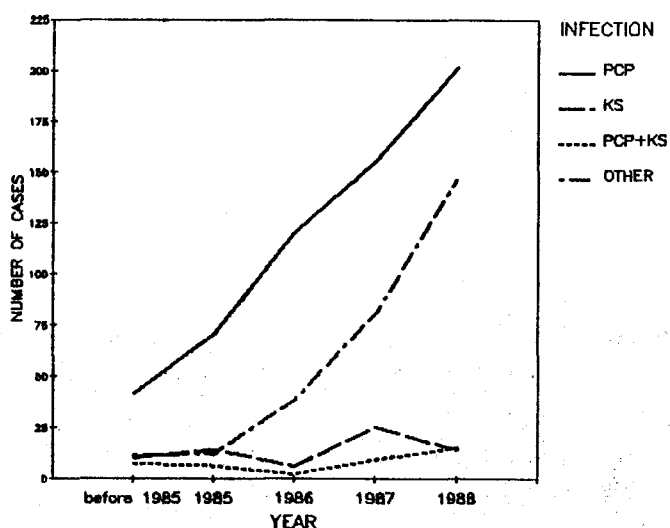


FIGURE 5

pneumonia (PCP). Of the cases reported during 1988, 53.5% developed PCP during the course of their illness (Figure 5). The percentage of cases reported with Kaposi's sarcoma (KS) has decreased from 13.7% in 1985 to 3.7% in 1988. On the other hand, an increase occurred in the percentage of cases reported with opportunistic infections other than KS and PCP. This percentage increased from 11.8% in 1985 to 38.8% in 1988. Examples of such infections are cryptococcal meningitis, *Mycobacterium avium*, *Candida* esophagitis, and toxoplasmosis.

Amebiasis

Nineteen persons were reported with amebiasis in 1988. The ages of the cases were fairly evenly distributed throughout the first five decades of life (Figure 6). "Other" was the most frequently

REPORTED CASES OF AMEBIASIS
IN VIRGINIA BY AGE, 1988

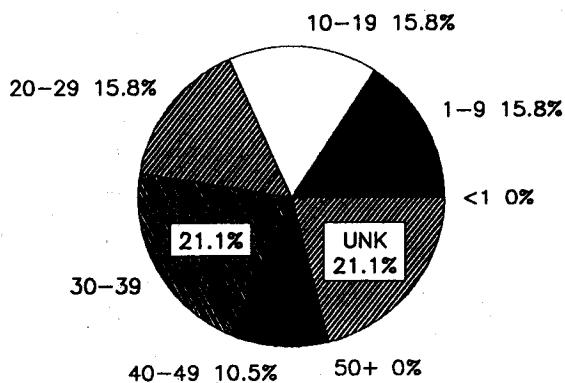


FIGURE 6

reported race group (47.4%); 26% were white and another 26% of the reports did not include race.

Nine cases were male, seven female, and three sex unknown.

Over half (52.6%) of the cases occurred in the Central Region of the state (Figure 7). Four cases

REPORTED CASES OF AMEBIASIS
IN VIRGINIA BY REGION, 1988

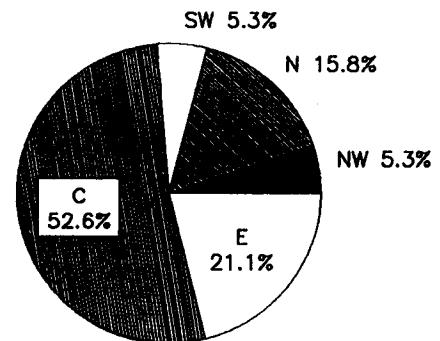


FIGURE 7

were reported from the Eastern Region, three from the Northern, and one each from the Northwest and Southwest. Half the cases

REPORTED CASES OF AMEBIASIS
IN VIRGINIA BY DATE OF ONSET, 1988

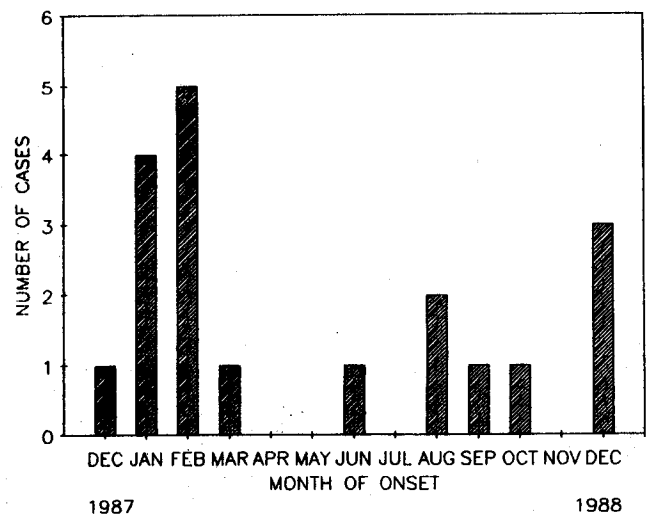


FIGURE 8

experienced onset within the first two months of the year (Figure 8).

Aseptic Meningitis

For the third year in a row, the number of cases of aseptic meningitis decreased, with 210 cases reported in 1988 (Figure 9). All age groups were affected (Figure 10). The three deaths which were attributed to aseptic meningitis occurred in the 50+ age group. The male to female ratio of reported cases was 1.2:1. Over one-half (55.7%) of the cases were white, 15.2% were black, and 3.3% were another race. Race was not reported

TREND IN REPORTED CASES OF ASEPTIC MENINGITIS IN VIRGINIA, 1979-1988

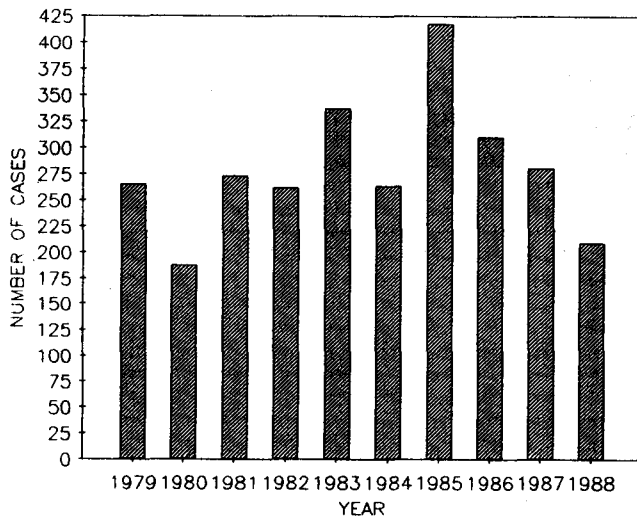


FIGURE 9

for 25.7% of the cases.

Although cases occurred in every month of the year, nearly half (48.1%) of the cases had onset during the months of August, September, or October (Figure 11). The Northern and Eastern Regions of the state had the most cases (72 and

69, respectively), followed by the Northwest (30), Central (25) and Southwest (14).

REPORTED CASES OF ASEPTIC MENINGITIS IN VIRGINIA BY AGE, 1988

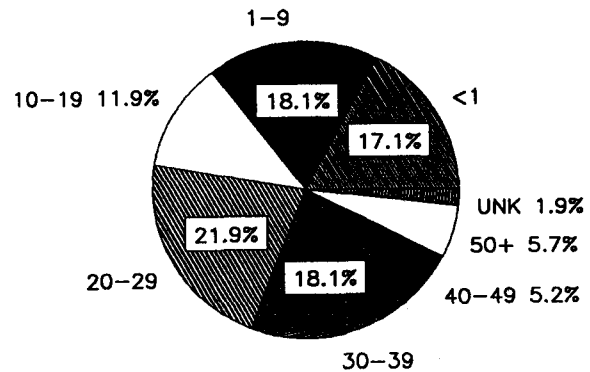


FIGURE 10

The etiologic agent was reported for 10 of the cases: 7 were echoviruses and one was a coxsackie virus.

ONSET MONTH OF CASES OF ASEPTIC MENINGITIS REPORTED IN VIRGINIA DURING 1988

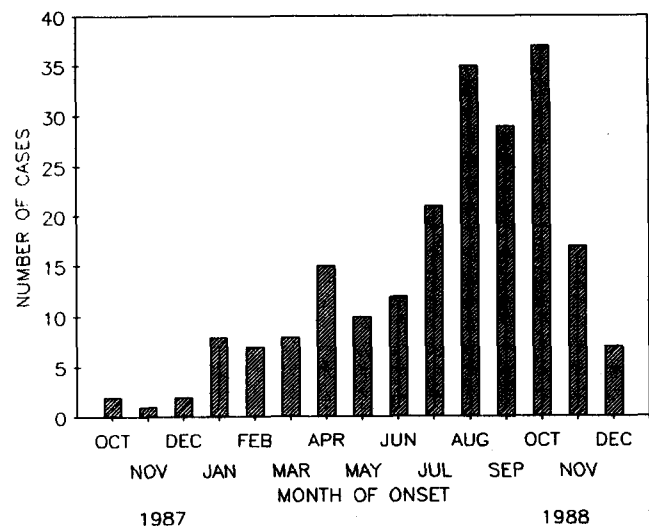


FIGURE 11

Bacterial Meningitis

Almost one-half (45.6%) of the 184 cases of bacterial meningitis reported in 1988 were caused by Haemophilus influenzae. An additional 26.6% were streptococcal. The distribution of types of bacterial meningitis cases reported in 1988 is presented in Table 2. Meningococcal meningitis is discussed elsewhere and is therefore not included in this section.

Table 2. Etiology of Bacterial Meningitis Reported in Virginia, 1988

Organism	Number of Cases	Percent of Cases
<u>Citrobacter diversus</u>	1	0.5
<u>Escherichia coli</u>	5	2.7
<u>Haemophilus influenzae</u>	84	45.6
<u>Klebsiella pneumoniae</u>	2	1.1
<u>Listeria monocytogenes</u>	4	2.2
<u>Mycobacterium tuberculosis</u>	2	1.1
<u>Staphylococcus</u>	10	5.4
<u>S. aureus</u>	(5)	(2.7)
<u>S. epidermidis</u>	(2)	(1.1)
unspecified	(3)	(1.6)
<u>Streptococcus</u>	49	26.6
Group A	(2)	(1.1)
Group B	(6)	(3.3)
<u>S. pneumoniae</u>	(38)	(20.6)
unspecified	(3)	(1.6)
Unspecified	27	14.7

Infants accounted for 39.1% of the cases. The next most commonly affected age group was that for age 1-9, responsible for 29.3% of the cases. The age distribution of persons reported with bacterial meningitis is shown in Figure 12.

Males were more likely than females (1.4:1) to have bacterial meningitis. Reported cases were twice as likely to be white as nonwhite.

The number of reports of bacterial meningitis increased between 1979 and 1985, but have been

REPORTED CASES OF BACTERIAL MENINGITIS IN VIRGINIA BY AGE, 1988

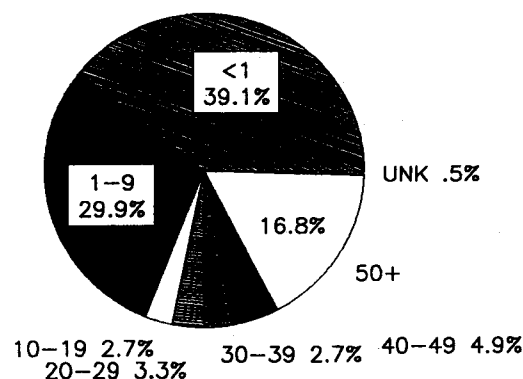


FIGURE 12

decreasing in the last three years (Figure 13). No seasonal trend was apparent for month of onset for the 1988 cases.

TREND IN REPORTED CASES OF BACTERIAL MENINGITIS, VIRGINIA, 1979-1988

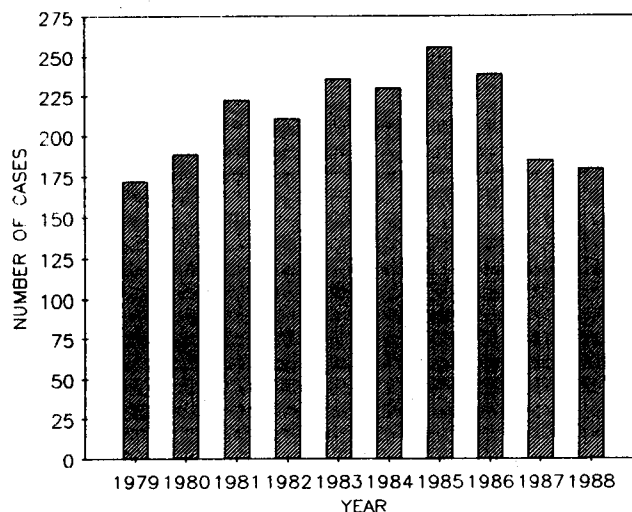


FIGURE 13

Twenty-five deaths caused by bacterial meningitis were reported. Ten were in infants, two were 1-5 years old, and 13 were age 40 or older.

Eleven of the persons who died were female and fourteen were male.

Of the cases of *Haemophilus influenzae* meningitis, 48.8% were infants, 48.8% were age 1-9, and the remaining two cases were between age 10 and 29. Twenty-six cases were reported as type B. Fourteen were reported to be ampicillin resistant.

Campylobacteriosis

The number of reported cases of *Campylobacter* infections increased 14% between 1987 and 1988, continuing the general increase observed throughout this decade (Figure 14).

TREND IN REPORTED CASES OF
CAMPYLOBACTERIOSIS IN VIRGINIA,
1980-1988

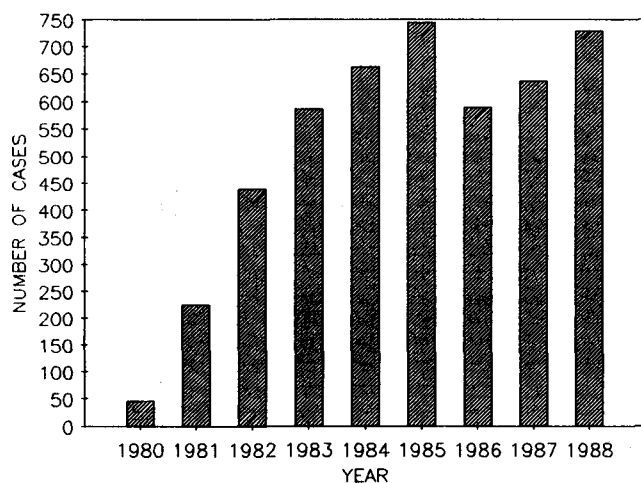


FIGURE 14

The age distribution of the 731 cases reported in 1988 is shown in Figure 15. Over one-fourth of the cases occurred in 20-29 year olds. The number of female cases (334) was only slightly less than the

number of male (346). Race was unknown for 61% of the cases, while 7% were black, 31% white, and 1% other race.

REPORTED CASES OF CAMPYLOBACTERIOSIS
IN VIRGINIA BY AGE, 1988

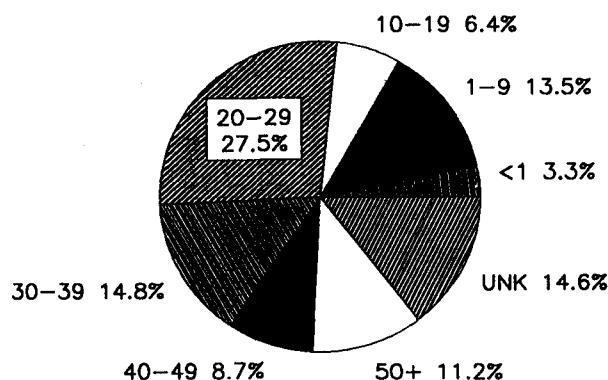


FIGURE 15

Cases occurred during each month of the year, with a peak in the summer months (Figure 16).

REPORTED CASES OF CAMPYLOBACTERIOSIS
IN VIRGINIA BY MONTH OF ONSET, 1988

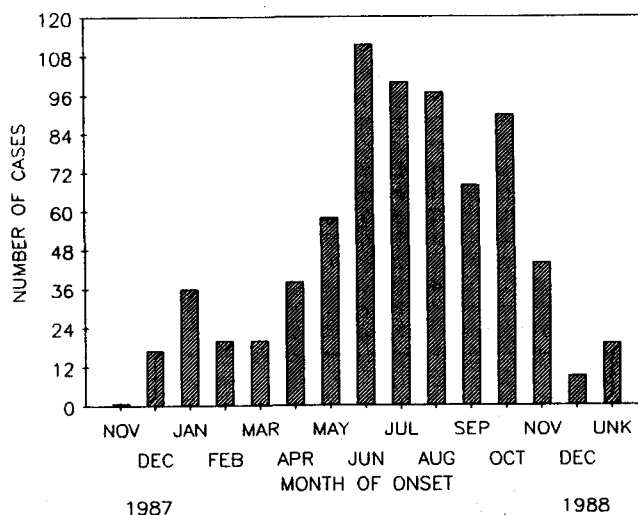


FIGURE 16

The majority of infections were caused by *C. jejuni* (406 cases). *C. coli* caused 21 infections, while *C. fetus* accounted for 13 and *C. pylori* for 3. The species was not specified in 288 reports. No deaths were reported.

Chickenpox

The majority (68.8%) of the 1,733 cases of chickenpox reported in 1988 were from the Eastern Region. Virginia Beach reported 799 cases, for a rate of 233 per 100,000 population. Although only 40 cases were reported from Williamsburg, that equated to a rate of 357. Other localities experiencing a rate of more than 50 per 100,000 population were Brunswick, Charles City, Rappahannock, and Warren counties and the cities of Hopewell, Newport News, and Norfolk.

Cases were reported throughout the year, with 65% reported during April through July (Figure 17).

REPORTED CASES OF CHICKENPOX
IN VIRGINIA BY MONTH OF REPORT, 1988

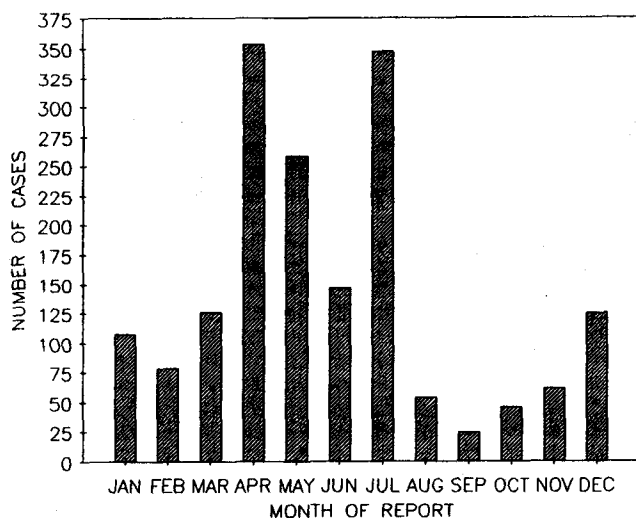


FIGURE 17

Encephalitis

Of the 44 reported cases of encephalitis, four were subsequent to a bout of chickenpox and 40 represented primary encephalitis. This summary will discuss the latter.

The age group with the most cases of primary encephalitis was persons 50 and older. The next most common age group was 1-9 year olds (Figure 18). Twenty-five cases were white, 12 black, and three of other or unknown race. Cases were divided evenly between the sexes (22 female, 18 male).

REPORTED CASES OF PRIMARY ENCEPHALITIS
IN VIRGINIA BY AGE, 1988

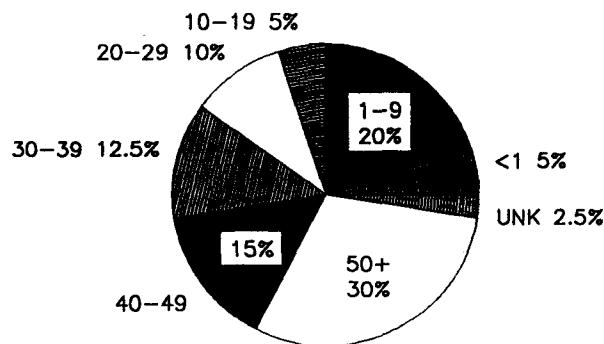


FIGURE 18

Cases occurred throughout the state in the following regional distribution: Northwest 5, Northern 7, Southwest 9, Central 6, Eastern 13. Ten of the cases reported in 1988 had onset during the latter half of 1987. Of those with onset in 1988, 11 occurred in the first quarter, seven in the second, five in the third, and five in the fourth.

The etiologic agent was specified for seven cases. Of these, six were herpes viruses and one was cytomegalovirus.

The number of cases of primary encephalitis reported during the last ten years has not varied much. The range of cases reported between 1979 and 1988 has been 28 to 61, with a mean of 40.2 cases per year.

Sixteen deaths were attributed to encephalitis in 1988, for a case fatality ratio of 39.0%. Four of the persons who died were children. Eleven were female. Twelve were white and four were black.

Foodborne Outbreaks

Foodborne outbreaks reported in 1988 are summarized in Table 3. The number of persons ill ranged from two to over seventy. Seven of the 15 outbreaks reported were caused by Salmonella, five of which were caused by S. enteritidis. Four outbreaks of S. enteritidis infection were related to the consumption of raw or undercooked eggs. An outbreak of restaurant associated hepatitis A was traced to poor personal hygiene of a worker responsible for handling food which was not cooked.

Fungal Infections

Although fungal infections other than histoplasmosis are not reportable in Virginia, laboratory and other reports are sometimes submitted to the health department for these

diseases. Five types of fungal infection were reported in 1988, for a total of 145 cases. Torulopsosis was the most frequently reported fungal infection, accounting for 72 cases, or 49.7% of the total. Aspergillosis followed with 65 cases or 44.8% of the total. The remaining cases included three of blastomycosis, two of cryptococcosis and two of mucormycosis. These counts do not include fungal meningitis which is discussed later under "other meningitis" or histoplasmosis which is under "diseases of low frequency." Fungal infections led to six deaths. The two most common types will be summarized below.

Torulopsosis (infection by Torulopsis glabrata) - All cases of torulopsosis were age 20 or older, with 79.2% age 50 or older. Age was not reported for 13.9%. Ten cases were white and five were black. Race was not reported for the remaining 79.2%. The disease was fairly evenly divided between the sexes - 52.8% were female, 45.8% were male.

Over half of the cases (54.2%) were from the Central Region. The Southwest Region accounted for 19.4%, Eastern 16.7%, Northwest 6.9%, and Northern 2.8%. Cases occurred throughout the year. Seven cases had onset during December 1987, 17 had onset during the first quarter of 1988, 14 during the second quarter, 17 during the third, and 17 during the fourth. One death was attributed to this disease.

Aspergillosis - Ninety-eight percent of cases of aspergillosis were 20 or older, with 40 cases (61.5%) occurring in persons age 50 and older. Only one case occurred in the less than 20 age group. Race was often unreported. Thirteen cases were white and six black. Cases were evenly distributed between the sexes. This disease caused one death.

Forty percent of the cases were from the Central Region, 23.1% from the Eastern, 20.0% from the

Southwest, and 16.9% from the Northwest. No cases were reported from the Northern Region. Cases clustered in the early part of the year, with 36.9% occurring during the first quarter compared to 13.8% occurred during the last quarter.

A. fumigatus was responsible for 21.5% of the cases; *A. niger* for 13.8%; and *A. flavus* and *A. ochraceus* each for 7.7%. Species was not identified for 36.9% of the cases.

Giardiasis

Two hundred fifty cases of giardiasis were reported in 1988, continuing a three-year downward trend (Figure 19), however, the peak in 1985 may have been an artifact of the disease becoming reportable in 1984. Giardiasis was most common in 1-9 year olds, who accounted for 41.6% of the cases reported (Figure 20). Cases were distributed evenly between the sexes (female

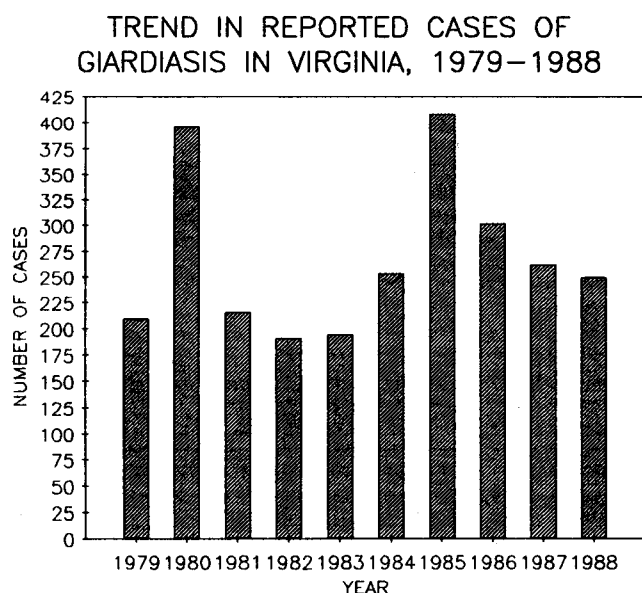


FIGURE 19

48.8%, male 47.2%). Over half (52%) of the cases were white, 2% were black, 12% were another race, and 34% had no race reported.

REPORTED CASES OF GIARDIASIS
IN VIRGINIA BY AGE, 1988

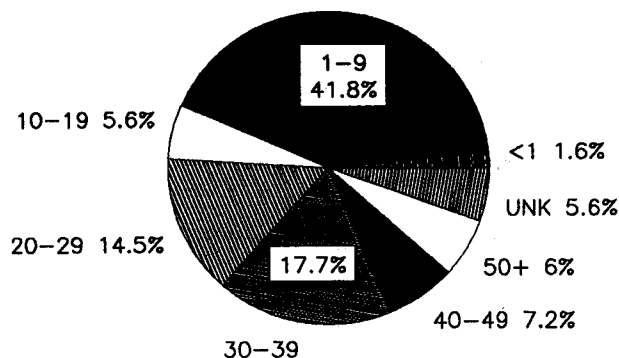


FIGURE 20

Disease onset occurred every month. The distribution of onset by quarter of the year was as follows: January-March 19.2%, April-June 16.4%, July-September 38.4%, October-December 26.4%, other or unknown 6.4%. Cases were evenly distributed between the regions of the state, ranging from 34 cases in the Northwest to 60 cases in the Eastern Region, with an average of 50 cases per region.

Gonorrhea

In 1988, 14,464 cases of gonorrhea were reported in Virginia. Gonorrhea morbidity had been steadily declining with minor increases since 1981. The rate of decline had slowed by June of 1988; and by the end of the year, it had reversed itself to

show a 0.87% increase over 1987. The current increases in gonorrhea are expected to continue as heterosexuals and minorities fail to adopt risk reduction behaviors and resistant gonorrhea becomes more prevalent.

The Eastern Region reported the most cases (7,359/51%), followed by the Central (2,390/17%), Northern (2,141/15%), Southwest (1,942/13%), and Northwest (632/4%).

The male to female ratio was 1.3 to 1. Ten percent of the cases were white and 90% were nonwhite. The 20-29 age group was the most frequently affected (Figure 21).

REPORTED CASES OF GONORRHEA
IN VIRGINIA BY AGE, 1988

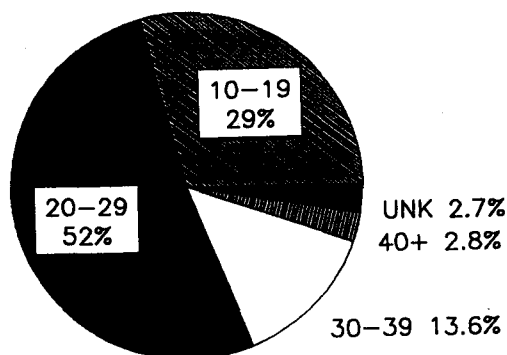


FIGURE 21

Pennicillinase-Producing Neisseria Gonorrhoeae (PPNG)

The gonococcal organism produces an enzyme called penicillinase which alters the structure of penicillin, causing it to be ineffective. In 1988, 549 cases of PPNG were reported in Virginia. This is

a 261% increase over the previous year; PPNG now comprises 3.8% of the state's gonorrhea morbidity.

The Northern Region reported the most cases (340/62%), followed by the Eastern (139/25%), Central (36/7%), Southwest (18/3%), and the Northwest Region (16/3%). Seventy-five percent of the cases occurred in persons between the ages of 15-29. There were five cases in the 10-14 age group.

The male to female ratio was 1.3 to 1. Ninety-two percent of the cases were black, 7% white, and 1% other.

The Northern and Eastern Regions plan to use ceftriaxone as the drug of choice by the end of 1989. It is anticipated that the other regions will do the same as they move from endemic to hyperendemic incidence levels.

Hepatitis A

The number of cases of hepatitis A reported in 1988 (362) was the largest number reported since 1975. Figure 22 shows the trend in cases over the last ten years. The large case count was due to outbreaks in the Hampton Roads area of the state. The outbreaks included 63 restaurant associated cases and 41 day-care associated cases. No deaths occurred.

The age distribution presented in Figure 23 shows that the age groups at greatest risk of acquiring hepatitis A in 1988 were 20-29 and 30-39 years olds. Sixty percent of the reported cases were male. The races of reported cases were as

follows: 83% white, 5% black, 5% other, and 7% unknown.

TREND IN REPORTED CASES OF HEPATITIS A IN VIRGINIA, 1979-1988

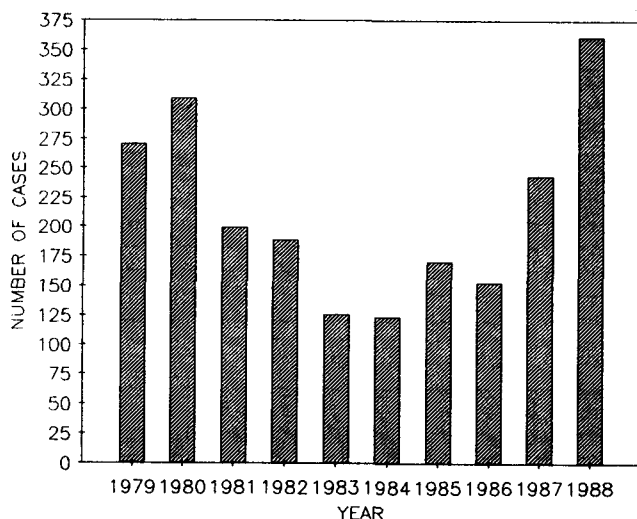


FIGURE 22

REPORTED CASES OF HEPATITIS A IN VIRGINIA BY AGE, 1988

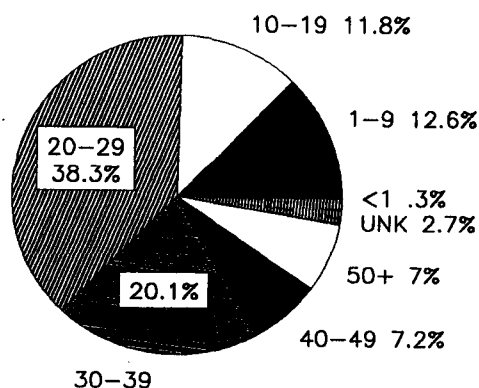


FIGURE 23

The month of onset of the cases is shown in Figure 24. The spike that occurred in February represents the restaurant associated outbreak. Onset date was not reported for 44 cases.

REPORTED CASES OF HEPATITIS A IN VIRGINIA BY MONTH OF ONSET, 1988

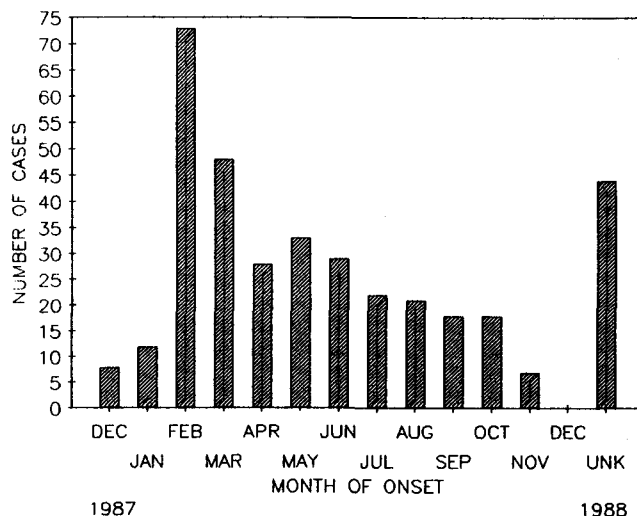


FIGURE 24

Risk factors for disease acquisition and further transmission included 104 with personal contact with a person with hepatitis A, 61 household contacts of a child/employee of day care, 35 foodhandlers, 30 children in/employees of day care, and 21 with international travel.

Hepatitis B

In 1988, 343 cases of hepatitis B were reported in Virginia. This is the smallest number of cases reported since 1978. The ten year trend in reported cases is presented in Figure 25. This decline may be due to the hepatitis B vaccine, screening of blood prior to transfusion, or a revised case definition. Beginning in 1987, the Office of Epidemiology accepted as official morbidity only those cases with evidence of newly acquired disease.

TREND IN REPORTED CASES OF
HEPATITIS B IN VIRGINIA, 1979-1988

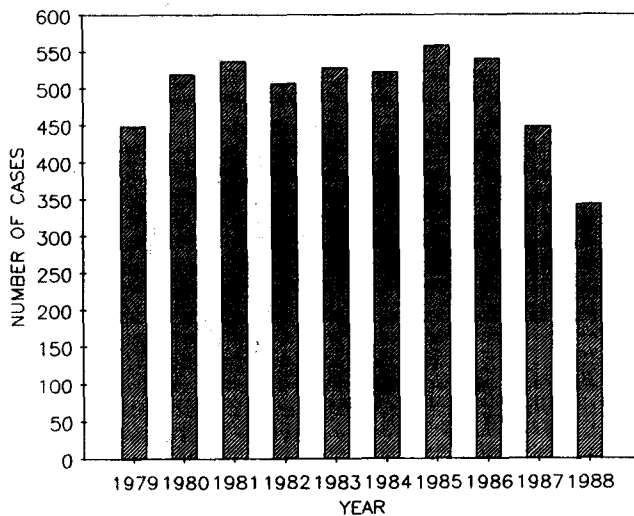


FIGURE 25

REPORTED CASES OF HEPATITIS B
IN VIRGINIA BY MONTH OF ONSET, 1988

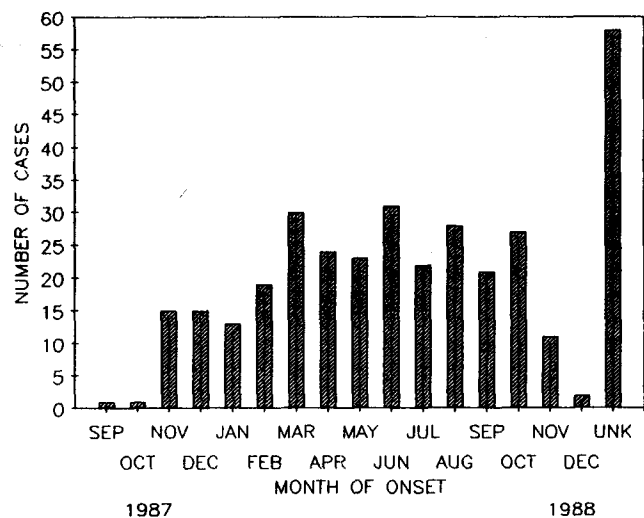


FIGURE 26

The Eastern Region reported the most cases (150), followed by the Southwest (63), Central (57), Northern (51) and Northwest (22) Regions. Persons in their twenties and thirties accounted for 71% of the cases. Only two cases occurred in children less than nine years old.

The male to female ratio was 1.5:1. Sixty percent of the cases were white, 34% black, 2% other, and 4% of unknown race.

Of the cases reported in 1988, 32 had onset in 1987. Cases occurred fairly consistently throughout the year, as shown in Figure 26. Onset date was not reported for 58 cases.

Seven (2%) of the persons with hepatitis B died. The age of one person who died was unknown. Two of the others were in their forties, two in their fifties, and two in their sixties.

Five cases were associated with an outbreak in a dialysis unit of a hospital.

Hepatitis Non-A Non-B

Seventy-seven cases of hepatitis non-A non-B were reported in 1988. Only twelve cases (15.6%) were under the age of twenty. Twenty to 29 year olds accounted for more cases (29.9%) than any other age group (Figure 27).

REPORTED CASES OF HEPATITIS
NON-A NON-B IN VIRGINIA BY AGE, 1988

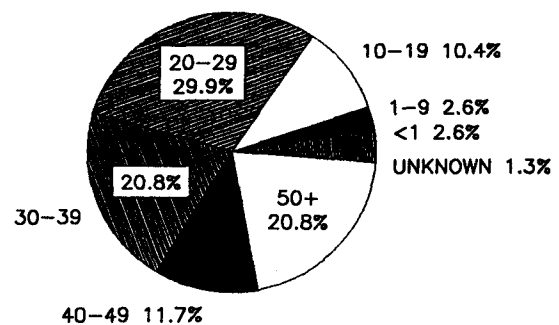


FIGURE 27

The majority (76.6%) of cases were white; 14.3% were black; 2.6% were another race; and 6.5% had no race reported. The male to female ratio was 1.6:1. Males accounted for 61.0% of the total.

Over half (55.8%) of the cases were reported from the Eastern Region. Virginia Beach alone accounted for 24.7%. (This was probably due to increased testing for hepatitis as a result of an increased level of suspicion raised by an outbreak of hepatitis A).

Onset of illness occurred fairly evenly during the first three quarters of the year (19, 17, and 16 cases, respectively). Only three cases had onset during the fourth quarter. Onset date was not reported for 23.4%.

Ten hepatitis non-A non-B deaths were reported in 1988. Seven were in the 50+ age group, two were 30-39 and one was an infant. Eight of the persons who died were male. Four deaths were from the Central Region, three from the Southwest, and one in each of the remaining three regions.

Hepatitis Unspecified

The number of reported cases of hepatitis unspecified totaled 257 in 1988. Most of the persons affected were adults; 78.6% were over the age of 20. Only 7% of the cases were age 0-19 (Figure 28).

One-third of the cases were black (32.7%), one-third were white (33.1%), and 7.4% were of another race. Race was unreported for 69 persons (26.8%) (Figure 29). The male to female ratio was 1.5:1.

REPORTED CASES OF HEPATITIS UNSPECIFIED
IN VIRGINIA BY AGE, 1988

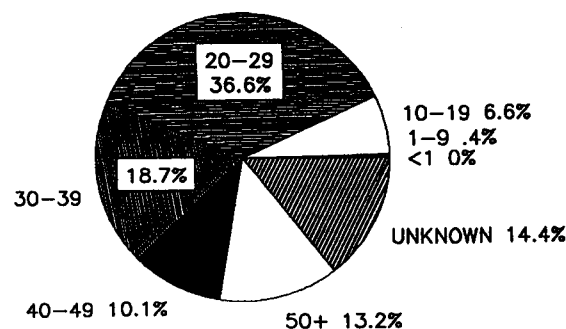


FIGURE 28

The Central and Eastern Regions of the state each accounted for 29% of reported cases. The Northern Region reported 20% of the cases, Northwest 13% and Southwest 8%. Date of onset was reported for one-fourth of the cases.

REPORTED CASES OF HEPATITIS UNSPECIFIED
IN VIRGINIA BY RACE, 1988

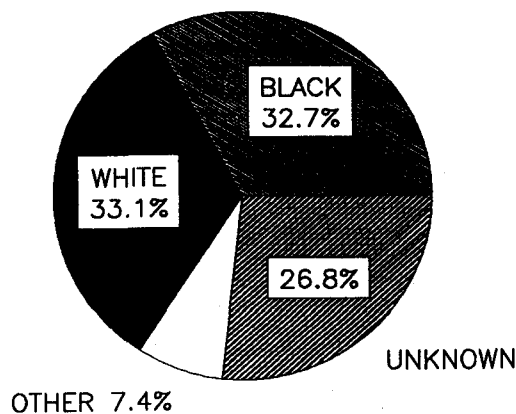


FIGURE 29

Two persons died from hepatitis unspecified. One was from the Northern Region. The other was from the Eastern Region.

Influenza

February was a significant month for influenza - 1,510 (59.8%) of the 2,524 cases reported during 1988 were reported that month (Figure 30). That was double the number reported in any other month.

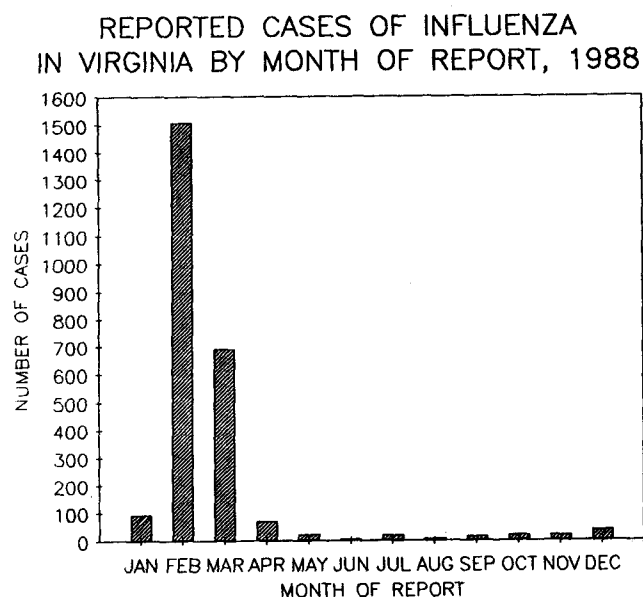


FIGURE 30

Influenza reporting varied greatly by locality. Eighty-eight localities did not report any influenza activity, while three (Appomattox, Lee, and Lynchburg) had rates close to 1,500 per 100,000 population. The Southwest Region experienced a reported influenza rate of 137 per 100,000 compared to rates of 38 for the Northwest, 16 for the Eastern, 14 for the Central and 2 for the Northern Region.

Kawasaki Syndrome

Fourteen confirmed cases of Kawasaki syndrome were reported in 1988, continuing a downward trend in the reporting of this disease in Virginia (Figure 31). Four of the cases (28.6%) were infants. The other ten were in the 1-9 age group, with the oldest being six years of age. Nine of the children were white, three black, and two of another race. Seven were female and seven were male.

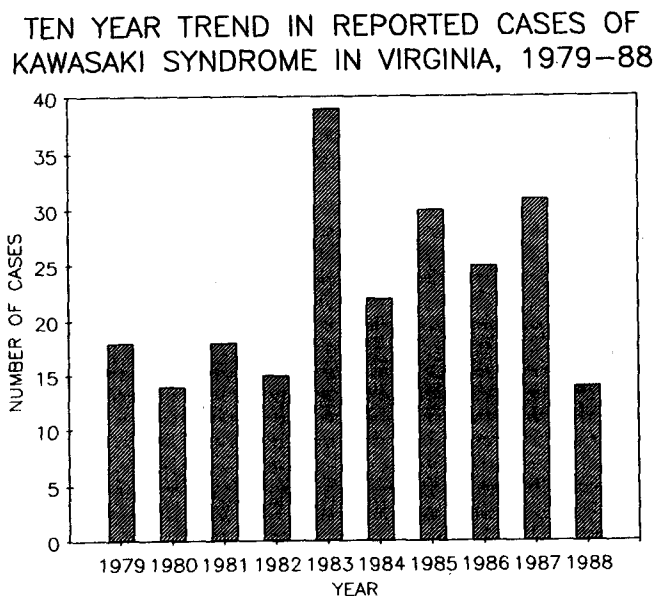


FIGURE 31

Half of the cases were reported as residing in the Eastern Region. Of the remaining, three lived in the Northwest, two in the Southwest, and two in the Central. No children from the Northern Region were reported with this disease.

Half of the cases had onset within the first three months of the year, with five cases experiencing onset in February. No cases occurred during the last two months of the year (Figure 32).

REPORTED CASES OF KAWASAKI SYNDROME IN VIRGINIA BY MONTH OF ONSET, 1988

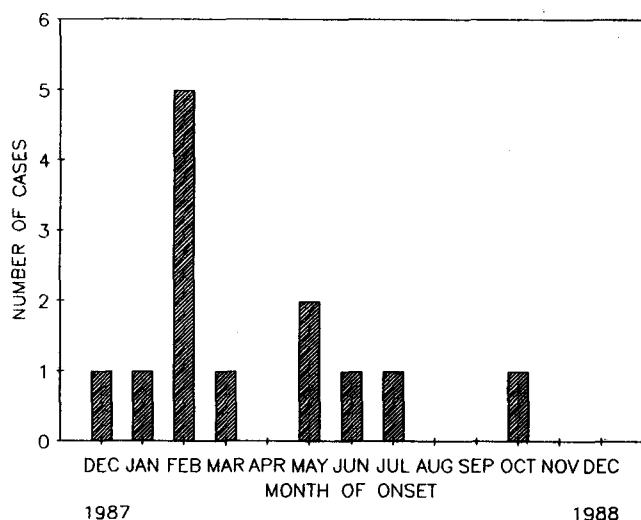


FIGURE 32

Legionellosis

Eight of the eleven cases of legionellosis reported in 1988 were age 50 or older. No cases were younger than 30. Ten were white and one was black. The male to female ratio was 2.7:1. Two of the cases died.

Five cases were reported from the Northwest Region and two each from the Southwest, Central, and Eastern Region. No cases came from Northern Virginia.

Five cases occurred during the first half of the year and three in the second half. Three of the cases reported in 1988 had onset in November of 1987. The cases were sporadic, not related to outbreaks.

Lyme Disease

Although Lyme disease was not reportable in 1988, disease reports were received and tallied.

Twenty-nine of the reported cases of Lyme disease met the case definition to be counted as official morbidity. While cases occurred in every age group except infancy, 69% were age 30 or older (Figure 33).

REPORTED CASES OF LYME DISEASE IN VIRGINIA BY AGE, 1988

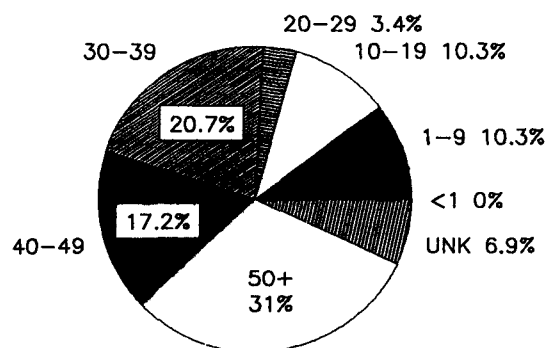


FIGURE 33

All of the cases whose race was reported were white. Race was not reported for six (20.7%) cases. Eighteen persons with Lyme disease were male and eleven were female for a male:female ratio of 1.6:1.

Over half of the cases resided in the Eastern Region (17 cases, 58.6%). Eight (27.6%) were from the Central Region, two from the Northwest and one each from the Northern and Southwest Regions.

Only ten of the 29 cases reported in 1988 had onset during the year of report. Two had onset in 1986 and 16 in 1987. The onset date was unknown for one person.

Malaria

All of the 23 reported cases of malaria were acquired outside of the United States - 15 in Africa, 4 in Central America, and 4 in Asia. Thirteen of the cases had received malaria prophylaxis. The organism was reported to be *P. falciparum* in eight cases and *P. vivax* in seven.

Nearly one-third of the cases (7 cases, 30.4%) were in their twenties (Figure 34). Eight of the persons with malaria were black, seven white, four another race, and four race unknown. Males outnumbered females 2.1 to one.

REPORTED CASES OF MALARIA
IN VIRGINIA BY AGE, 1988

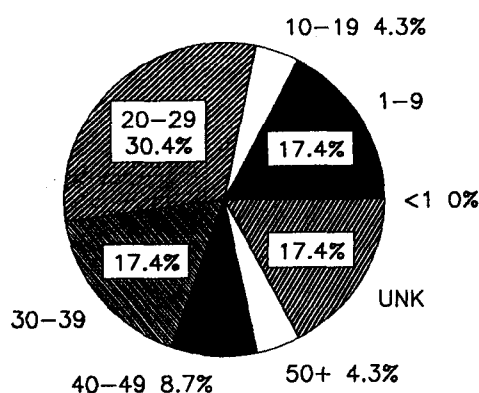


FIGURE 34

Fifteen cases (65.2%) resided in the Northern Region. Three were from the Southwest, three from the Eastern, one from the Northwest, and one from the Central Region. Cases occurred evenly throughout the year - five in the first quarter, six each in the second and third quarters, and five in the fourth quarter of the year. One of the 1988 cases had onset in 1987.

Measles

Three outbreaks of measles occurred in 1988. The largest (96 cases) occurred at a college in Lynchburg. Another 74 cases were clustered in Prince William county and 54 cases in Frederick county/Winchester city.

The total number of measles cases reported during the year was 239, only one of which was imported. More cases were reported in 1988 than in the previous seven years combined (149 cases), as shown in Figure 35.

TREND IN REPORTED CASES OF MEASLES
(RUBEOLA) IN VIRGINIA, 1979-1988

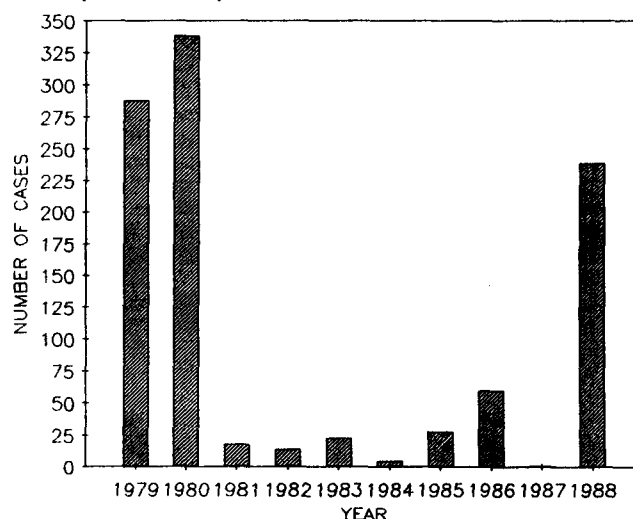


FIGURE 35

The 10-19 age group was the most likely to be affected. Almost three-fourths (72.4%) of the cases were in this group (Figure 36). Most of the cases (84.9%) were white. Only two were black and one was another race. Race was not reported for 33 persons. Slightly more females (127) than males (109) were ill with measles.

REPORTED CASES OF MEASLES IN VIRGINIA BY AGE, 1988

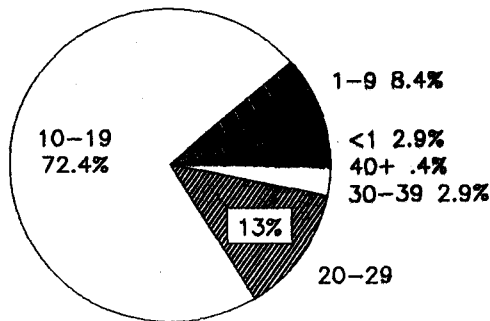


FIGURE 36

Over three-fourths (76.2%) of the cases were not preventable. (A preventable case of measles is defined as a U.S. citizen who is at least 16 months old, was born after 1956, lacks evidence of immunity, has no medical contraindication to vaccination, and has no religious or philosophical exemption). Most (166 cases, 69.5%) had been immunized, at the following ages: 5 under one year, 87 between 12 and 15 months, 70 over 15 months, and 4 at undocumented ages.

Meningococcal Infections

Neisseria meningitidis infections were reported in 59 Virginians in 1988, an 18% decrease from the 72 reported in 1987. The distribution of cases by region of the state was as follows: Northwest 12, North 6, Southwest 13, Central 3, East 25.

Children under 9 years of age accounted for 61% of the reported cases; 27% occurred in infants (Figure 37). Fifty-six percent of the cases were female; 44% were male. Seventeen percent were

black, 63% were white, 2% were another race, and 19% were race unknown.

REPORTED CASES OF MENINGOCOCCAL INFECTIONS IN VIRGINIA BY AGE, 1988

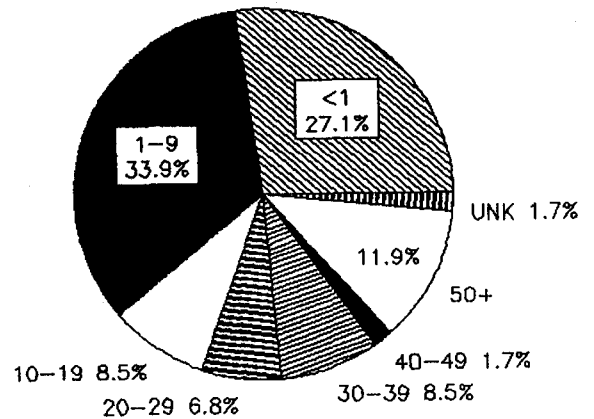


FIGURE 37

Twelve of the cases died, for a case fatality ratio of 20.3%. Four of the deaths were in infants, 5 were in the 1-9 year age group, and 3 were adults over the age of 45. Seven of the deaths occurred during the first quarter of the year.

REPORTED CASES OF MENINGOCOCCAL INFECTIONS IN VIRGINIA BY MONTH OF ONSET, 1988

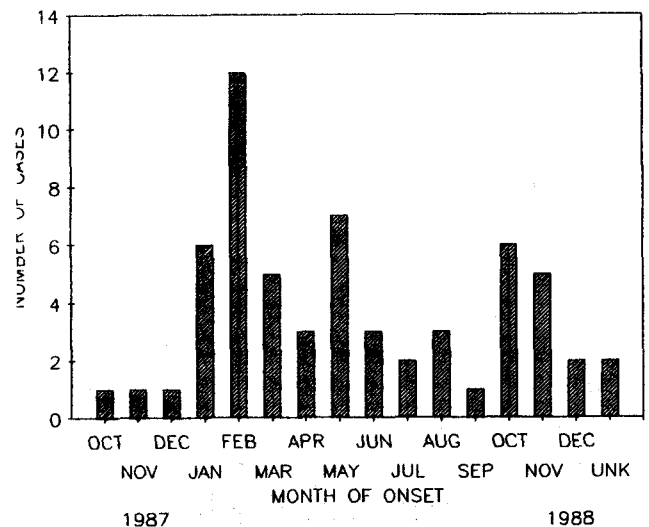


FIGURE 38

Cases occurred throughout the year, with a peak in February (Figure 38). The serotype was reported for 28 (47.5%) of the cases. Fifteen organisms were identified as type B, twelve as type C, and one as type W135.

Mumps

One-half of the 139 cases of mumps reported in 1988 were aged 18-21, due to an outbreak at a university in Richmond City. The age distribution of all the cases of mumps is presented in Figure 39.

REPORTED CASES OF MUMPS IN VIRGINIA
BY AGE, 1988

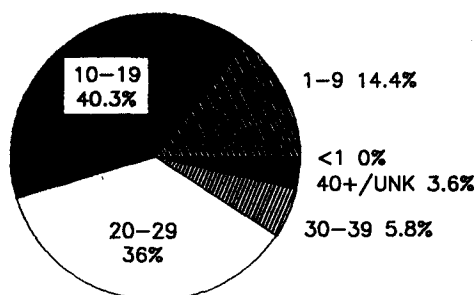


FIGURE 39

One hundred of the cases (71.9%) were white, 24 were black, two were of another race, and 13 did not have race reported. Seventy-six of the cases were female and 63 were male.

Because of the outbreak, the Central Region accounted for the most cases (78), followed by the Northern (21), Northwest (18), Southwest (12) and Eastern (10) Regions. Cases occurred

throughout the year, peaking in March and April due to the outbreak (Figure 40).

REPORTED CASES OF MUMPS IN VIRGINIA
BY MONTH OF ONSET, 1988

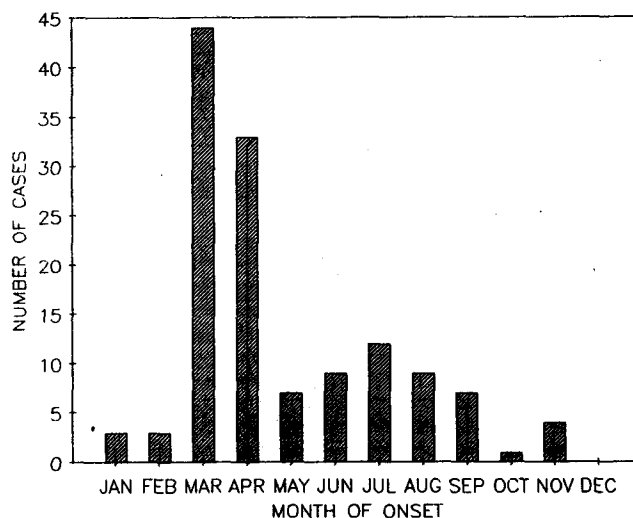


FIGURE 40

Nosocomial Outbreaks

Eight nosocomial outbreaks were reported in 1988, affecting two to nine persons each. Three of the outbreaks were caused by *Staphylococcus aureus*. The causes of the others included the hepatitis B virus, mites, a streptococcal organism, a virus, and an unknown agent.

Occupational Illnesses

Of the 180 cases of occupational illnesses reported by physicians in 1988, one was a case of occupational asthma and the rest were asbestosis. The cases of asbestosis are summarized below.

Only two persons with asbestosis were younger than age 30. Most (78.2%) were age 50 or older (Figure 41). Only four cases were female, for a male to female ratio of 43.5:1. Seventy-one percent were white, 18% black, and 10% race unspecified.

REPORTED CASES OF ASBESTOSIS
IN VIRGINIA BY AGE, 1988

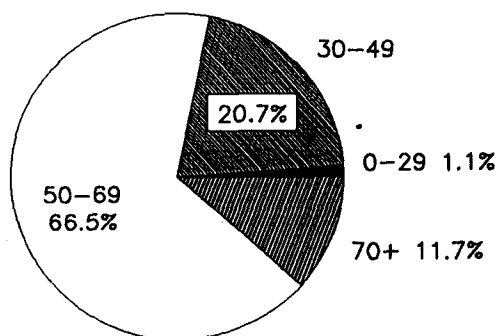


FIGURE 41

The most commonly reported industry was shipbuilding, which accounted for 126 (70.4%) of the asbestosis cases. The textile industry employed 17.9% of the cases. The rest of the cases were scattered throughout several other industry categories.

Place of employment was Portsmouth for 81 (45.3%) cases, Newport News for 43 (24.0%) and Chesterfield for 35 (19.6%). The remainder of the persons with asbestosis were dispersed throughout other localities in the Eastern Region, except for one case in the Northwest.

Other Meningitis

Meningitis caused by organisms other than bacteria or viruses are classified in the "other meningitis" category. In 1988, this category included 26 reports of cryptococcal meningitis, five cases of carcinomatous meningitis, one case of meningitis due to coccidioidomycosis, and 16 cases of unspecified cause, for a total of 47 cases in this disease category.

Nineteen deaths occurred for a case-fatality ratio of 40.4%. Nine deaths were due to cryptococcal meningitis, five to carcinomatous meningitis, one to coccidioidal meningitis, and four to an unspecified type of organism.

Parasites, Intestinal

Although intestinal parasites are not reportable conditions, 105 cases were reported in 1988. (Giardiasis and amebiasis are reportable and are discussed separately). The most commonly reported parasites were Ascaris (roundworm, 27 cases), hookworm (24 cases), Enterobius vermicularis (pinworm, 19 cases), Strongyloides stercoralis (14 cases), and Trichuris trichiura (tapeworm, 10 cases).

Cases were three times more likely to be nonwhite than white. Two-thirds of the cases were from the Central (32 cases) and Eastern (39 cases) Regions.

Pertussis

Twenty-nine cases of pertussis were reported in 1988, 23 of which (79.3%) occurred in infants. Three cases were one year of age, two were adults, and one did not have age reported. Race was not reported for three-fourths of the cases. Of those with known race, four were white, two black, and one another race. Sixteen cases were male and 13 female.

The Eastern (13) and Northwest (12) Regions of the state accounted for most of the cases. Two were reported from the Southwest and one each from the Northern and Central Regions. Cases occurred throughout the year, with peaks in February and July (Figure 42).

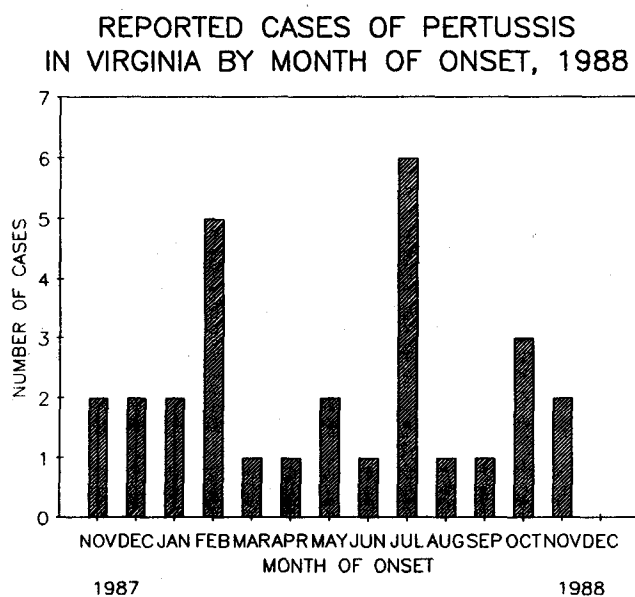


FIGURE 42

Rabies

The total number of laboratory confirmed rabid animals for 1988 was 366, only 3 more than reported in 1987 and approximately one half of the 745 reported in the peak year of 1982 (Figure 43). Rabid raccoons accounted for 60% of the rabid animals (Figure 44) and were reported from 42 counties and cities. This reflected an expansion of the raccoon rabies outbreak into 8 new counties and cities; Amelia, Charles City, Nottoway, Williamsburg, Craig, James City, York, and Pulaski.

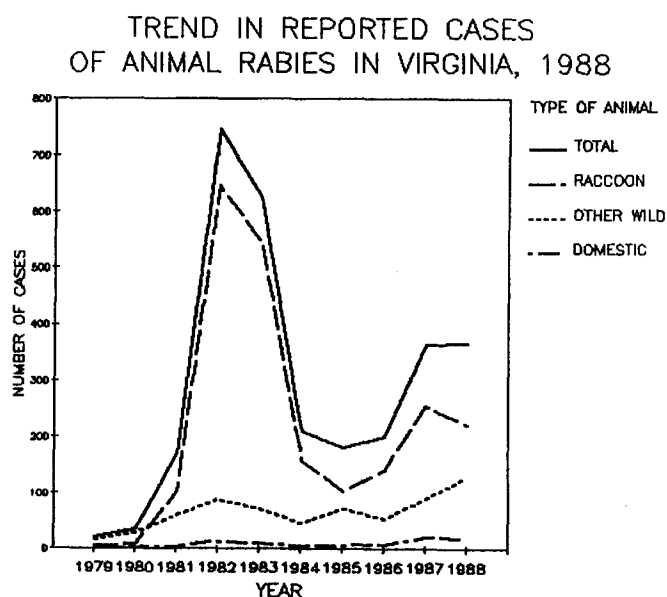


FIGURE 43

Skunks accounted for 24% of the rabid animals in 1988, 18 (20%) of these were reported from 4 counties in the skunk rabies endemic area of Southwest Virginia. The rest occurred in the raccoon outbreak area. Although traditionally the rabid skunks from the raccoon outbreak would be considered "spillover", the disproportionate number of skunks (27) relative to raccoons (4) in Page and Shenandoah Counties may reflect skunk

to skunk transmission of the raccoon rabies virus. Skunks represented 16% of the rabid animals in 1987. Other terrestrial wildlife reported with rabies in 1988 included 24 foxes, 2 groundhogs, and 1 bobcat. In 1987 there were 23 foxes, 2 beavers, and 1 groundhog. Bats accounted for 3% of the rabid animals in 1988 and 2% in 1987.

REPORTED CASES OF ANIMAL RABIES
IN VIRGINIA BY SPECIES, 1988

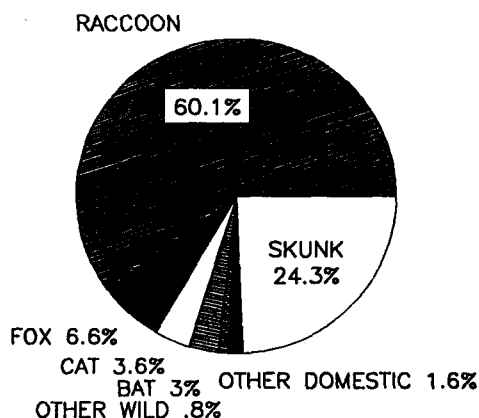


FIGURE 44

Rabid domestic animals included 13 cats, 2 cows, and 1 each dog, goat, horse, and sheep in 1988. These numbers are similar to those for 1987 (12 cats, 3 cows, 2 dogs, 2 horses, and 1 goat).

In 1988, 11% of the 3,351 animals tested for rabies were positive. The most commonly tested animals were raccoons (23%) and cats (23%). Dogs comprised 16% of the animals tested. Although skunks only accounted for 4% of the animals tested, 65% of these were rabid. The proportion of tested raccoons with rabies was 28% while less than 2% of the cats and dogs that were tested were positive. Twelve percent of the animals tested came from Fairfax County, 8% from Chesterfield, 6% each from Henrico and Prince William, 5% from Loudoun and the rest of

the localities accounted for between 0 and 3% each. The number of animals tested by month, and the results of those tests, are shown in Figure 45.

NUMBER OF ANIMALS TESTED FOR RABIES
BY MONTH AND TEST RESULT, 1988

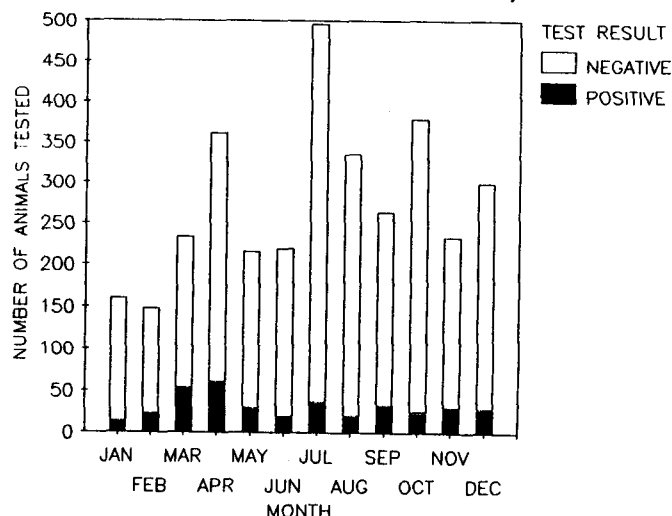


FIGURE 45

Human exposure was reported for 90% of the cats, 89% of the dogs, 25% of the bats, 20% of the raccoons, 19% of the foxes, and 8% of the skunks that were tested.

Rocky Mountain Spotted Fever

Fewer cases of Rocky Mountain spotted fever were reported in 1988 (17 cases) than in any of the past ten years (Figure 46). All age groups were affected except for infants (Figure 47). The only race reported was white. Nine of the cases were female and eight were male. Two deaths were attributed to this disease.

Thirteen of the cases reported a history of a tick bite. Three had been in a tick infested area.

Eleven experienced a rash. Laboratory tests used to confirm disease included IFA in 14 cases, FA in two, and OX19 in one.

TEN YEAR TREND IN REPORTED CASES OF ROCKY MOUNTAIN SPOTTED FEVER IN VIRGINIA, 1979-88

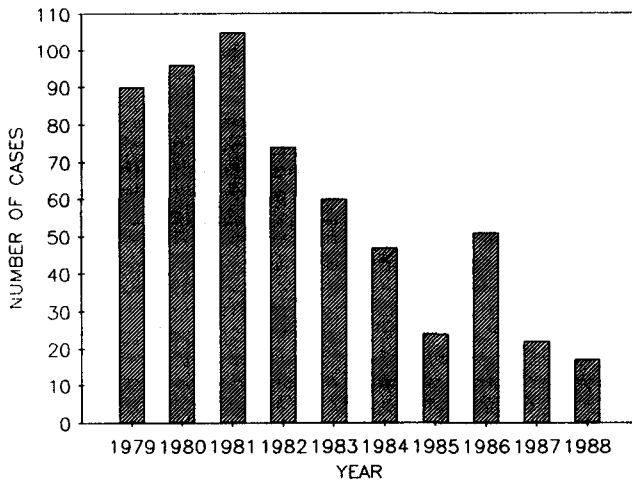


FIGURE 46

REPORTED CASES OF ROCKY MOUNTAIN SPOTTED FEVER IN VIRGINIA BY AGE, 1988

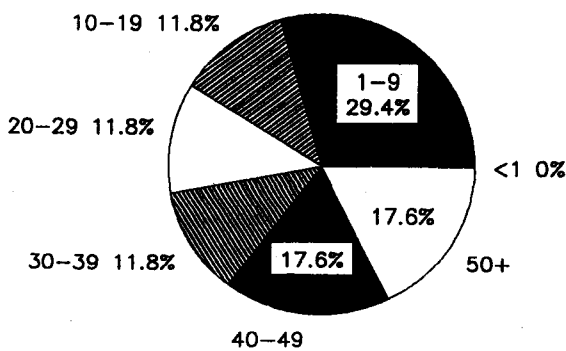


FIGURE 47

Reported cases occurred in every region of the state, but more often in the Central and Southwest than in the other areas (Figure 48). Twelve cases

(70.6%) had onset during the second quarter of the year. Four experienced onset during the third quarter. Date of onset was not reported for one person.

REPORTED CASES OF ROCKY MOUNTAIN SPOTTED FEVER IN VIRGINIA BY REGION, 1988

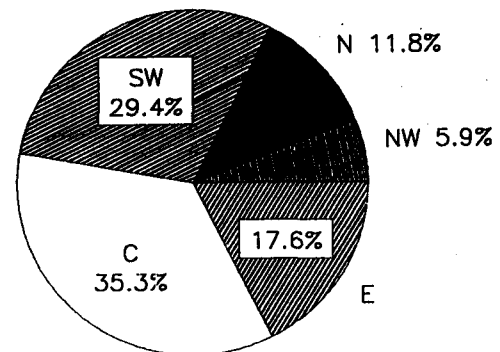


FIGURE 48

Salmonellosis

The 1,733 cases of salmonellosis reported in 1988 represented 67 species of *Salmonella*. The most common species are presented in Table 4. Some cases were associated with outbreaks, as shown in Table 3, under Foodborne Outbreaks.

Salmonellosis occurred in every age group (Figure 49). One-third of the cases were children under ten years old. Six of the seven deaths due to this disease occurred in adults over 40. The age of one person who died was unknown.

Slightly fewer males (46%) than females (48%) were reported with salmonellosis. Race was not

reported for over half of the cases. Thirty-one percent of the cases were white, 16% black, and 1% another race.

Table 4. The Most Common Species of Salmonella Reported in Virginia in 1988

Species	Number of Reported Infections	Percent of Reported Infections
<i>S. typhimurium</i>	402	23.2
<i>S. enteritidis</i>	252	14.5
<i>S. heidelberg</i>	130	7.5
<i>S. hadar</i>	109	6.3
<i>S. newport</i>	83	4.8
<i>S. ohio</i>	51	2.9
<i>S. thompson</i>	34	2.0
<i>S. montevideo</i>	25	1.4
<i>S. berta</i>	25	1.4
<i>S. agona</i>	20	1.1
<i>S. braenderup</i>	20	1.1
unspecified	341	19.7
Total	1733	100.0

REPORTED CASES OF SALMONELLOSIS IN VIRGINIA BY MONTH OF ONSET, 1988

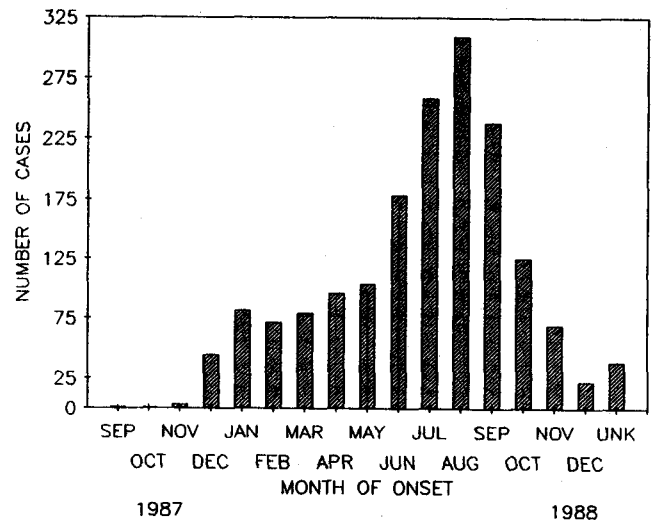


FIGURE 50

REPORTED CASES OF SALMONELLOSIS IN VIRGINIA BY AGE, 1988

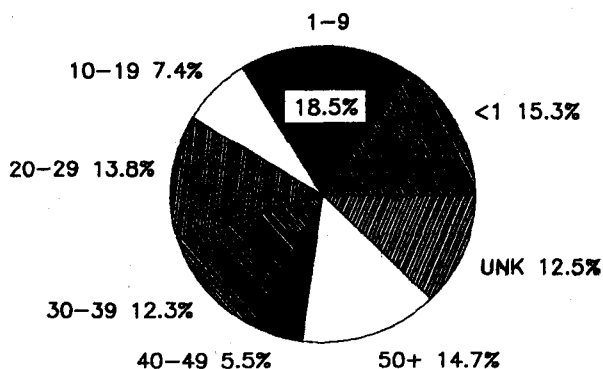


FIGURE 49

Cases occurred throughout the year (Figure 50), with 47% experiencing onset during July, August, and September.

Shigellosis

Twice as many cases of shigellosis were reported in 1988 (497) as in 1987 (247). The ten year trend of shigellosis reports is depicted in Figure 51. Eighty percent (399 cases) were caused by *S. sonnei*. *S. flexneri* caused 36 cases, *S. boydii* 4, and *S. dysenteriae* 1. The species was not specified in 57 cases. Twelve of the cases of *S. sonnei* were associated with an outbreak in an institution.

The Northwest and Southwest Regions of the state experienced little shigellosis activity (27 and 47 cases, respectively) compared to the Northern (124), Eastern (139) and Central (160) Regions. Nearly half of the cases (47.5%) occurred in children age 1-9. The age distribution of cases is shown in Figure 52.

TREND IN REPORTED CASES OF SHIGELLOSIS IN VIRGINIA, 1979-1988

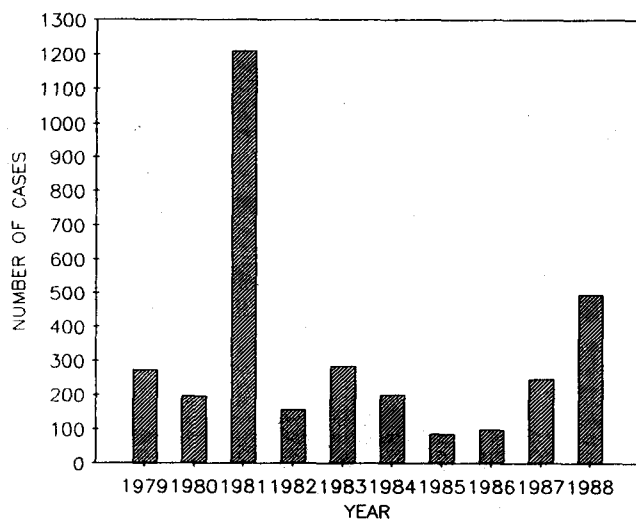


FIGURE 51

REPORTED CASES OF SHIGELLOSIS IN VIRGINIA BY RACE, 1988

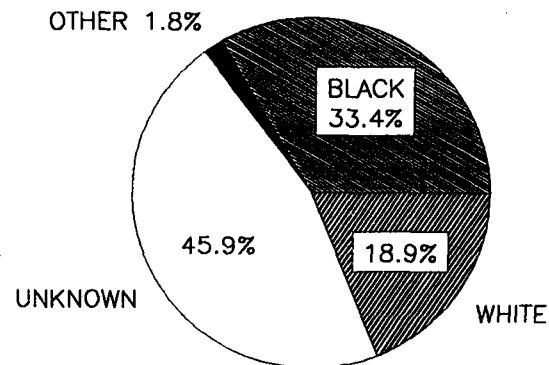


FIGURE 53

REPORTED CASES OF SHIGELLOSIS IN VIRGINIA BY AGE, 1988

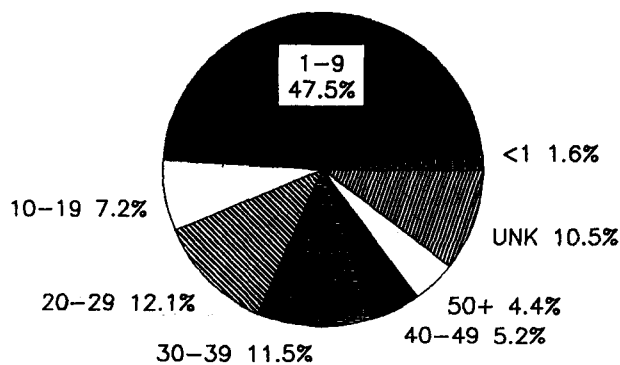


FIGURE 52

Females were reported more frequently than males (52% vs. 43%, 5% unknown). Black race was reported more often than white (Figure 53). Race was not reported for 46% of the cases.

Cases had onset throughout the year (Figure 54). The months with the most disease activity were June and July. No deaths were reported.

REPORTED CASES OF SHIGELLOSIS IN VIRGINIA BY MONTH OF ONSET, 1988

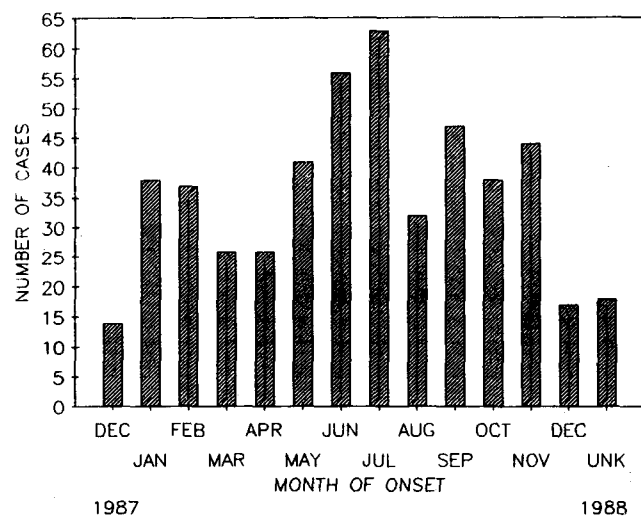


FIGURE 54

A community wide outbreak occurred in Petersburg. No common source was identified.

Syphilis

Early Syphilis

The case definition for early syphilis is primary, secondary, and latent syphilis under one year's duration. In 1988 there were 822 cases of early syphilis reported in Virginia which was a 45% increase over the previous year. This was the largest increase this decade (Table 5). The decreases experienced through the mid-1980s were partly attributed to the health departments' disease intervention efforts and to the modification of sexual behavior through the practice of safer sex in the gay/bisexual community. The current increases appear to be occurring in the heterosexual and minority populations.

The Central Region reported the most cases (344/42%), followed by the Eastern (242/30%),

Southwest (125/15%), Northern (92/11%), and Northwest (19/2%) Regions.

The male to female ratio was 1.3:1. Thirteen percent of the cases were white, and 87% were nonwhite. The majority of cases of primary and secondary syphilis were age 20-29 (Figure 55).

REPORTED CASES OF PRIMARY AND SECONDARY SYPHILIS IN VIRGINIA BY AGE, 1988

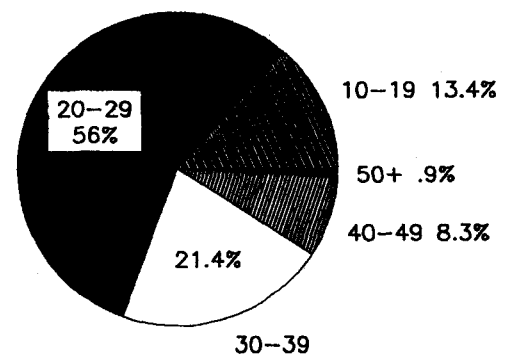


FIGURE 55

Table 5. Ten Year Trend in Reported Cases of Early Syphilis by Stage, Virginia, 1979-1988

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Primary/Secondary Syphilis										
Number of cases reported	492	584	687	647	560	420	300	326	318	449
% change from previous year	+3.8	+18.7	+17.6	-5.8	-13.4	-25.0	-28.6	+8.7	-2.5	+41.2
Early Latent Syphilis										
Number of cases reported	426	415	540	525	475	351	260	241	250	373
% change from previous year	-0.5	-2.6	+30.1	-2.8	-9.5	-26.1	-25.9	-7.3	+3.7	+49.2
Total Early Syphilis										
Number of cases reported	918	999	1,227	1,172	1,035	771	560	567	568	822
% change from previous year	+1.8	+8.8	+22.8	-4.5	-11.7	-25.5	-27.4	+1.3	+0.2	+44.7

Congenital Syphilis

In 1988 there were four cases of early congenital syphilis; two in the Eastern Region, one in the Northern, and one in the Central Region. All of the infants were black and three of them males. All were born with clinical signs, but there were no deaths.

All of the mothers were single and their ages ranged from 15 to 29 with a mean age of 23. None had prior history of syphilis, and only one of the four had received prenatal care. The one mother who had received prenatal care was negative in June of 1987 but was infected at delivery in April of 1988.

The four cases in 1988 is the highest number of cases since 1982, when there were nine cases. This increase can be partly attributed to the rising incidence levels of syphilis in the female population. The male to female ratio of early syphilis dropped from a high of 2.6:1 in 1980 to a low of 1.3:1 in 1988. Early congenital syphilis cases follow increases of early syphilis with a lag of one year. Because of the 45% increase of early syphilis and the rising proportion of females, the four congenital syphilis cases in 1988 may be the beginning of a cycle of increases.

Tuberculosis

In 1988, 406 cases of tuberculosis were reported in Virginia for a case rate of 6.8/100,000, compared with the national rate of 9.1. This is the fewest cases ever reported. The ten year trend showing a 5 percent reduction per year is presented in Figure 56.

TREND IN REPORTED CASES OF TUBERCULOSIS
IN VIRGINIA, 1979-1988

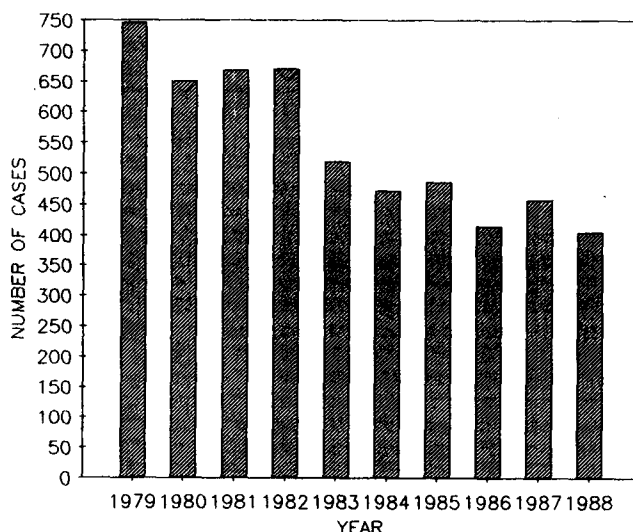


FIGURE 56

Tuberculosis continues to be more prevalent in urban areas. The Eastern Region reported 128 cases with 95, 90, 58, and 35 reported respectively by the Northern, Central, Southwest, and Northwest Regions.

Persons 65 and over accounted for 38 percent of all 1988 cases. Conversely, less than three percent of the cases occurred in children under 15 years of age. Two-thirds of the 1988 cases were male.

The 1988 case rate for whites was 3.7/100,000, while that of nonwhites was 18.1. Foreign-born persons contributed 20 percent to the 1988 tuberculosis morbidity.

Infection with tubercle bacilli supercedes disease by years in most TB cases. Therefore, the onset of tuberculosis is not documented.

No deaths due to tuberculosis were reported. Since the advent of effective chemotherapy, tuberculosis is rarely the cause of death in developed countries.

Typhoid Fever

Thirteen cases of typhoid fever were reported in 1988. Four were acquired in the U.S.A., two in India, two in the Phillipines, one in Chile, and one in Bolivia. Four of the cases were age 12 and under, eight were age 18 to 33, and one was over the age of 60. Three persons with typhoid fever were white, one black and four of another race. Race was not reported for five cases. The male:female ratio was 1.6:1.

Eleven of the cases were from the Northern Region. One was from the Northwest and one from the Eastern Region. January was the month with the greatest number of cases (Figure 57).

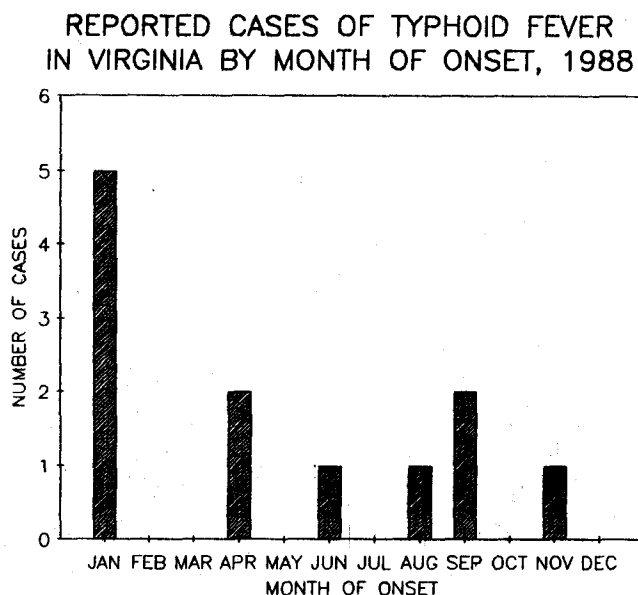


FIGURE 57

Yersiniosis

Yersiniosis is not a reportable disease in Virginia, however, when reports are received they are recorded. *Y. enterocolitica* was specified as the causative organism for 35 of the 37 reported cases of yersiniosis. No organism was specified for the other two cases.

Fifteen of the cases (40.5%) were infants. Children and young adults were more likely to be affected than older adults (Figure 58). Race was frequently unreported. For cases in which race was specified, 10 were black, four were white, and one was another race. Nineteen cases were female and 16 were male. The sex of two cases was not reported.

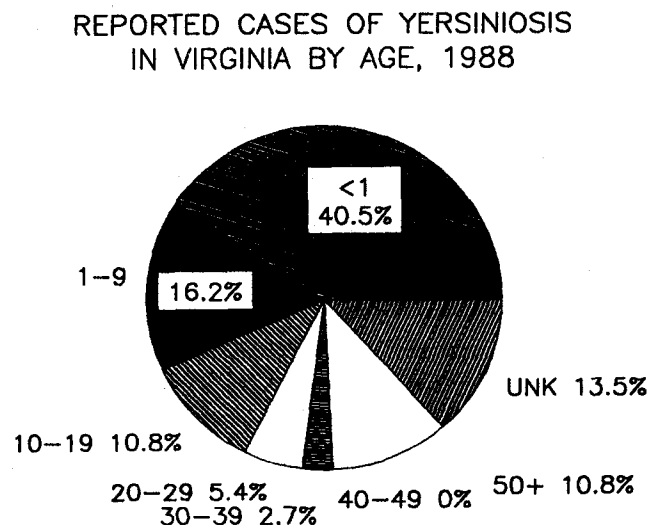


FIGURE 58

Cases resided in every region of the state, with eleven each in the Southwest and Central Regions, nine in the Northern, and three each in the Northwest and Eastern Regions. Onset

occurred throughout the year with no apparent seasonality (Figure 59).

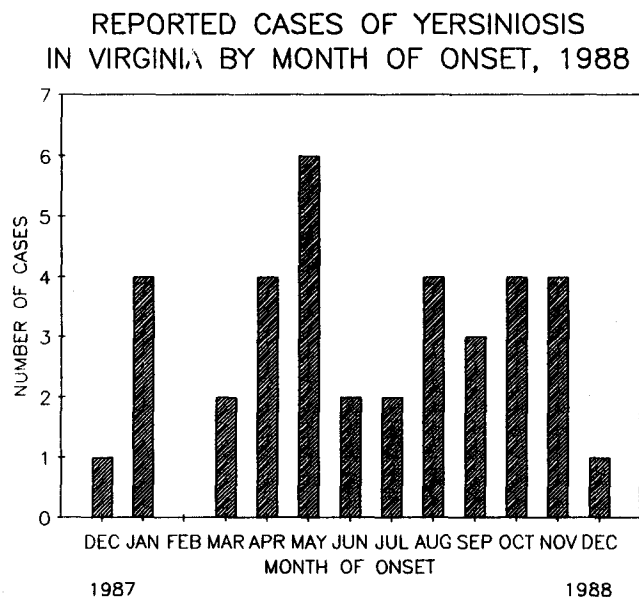


FIGURE 59

Diseases of Low Frequency

Zero cases - No cases were reported of the following reportable conditions:

Anthrax	Poliomyelitis
Arboviral infections	Psittacosis
Botulism, foodborne	Q fever
Cholera	Reye syndrome
Congenital rubella syndrome	Smallpox
Diphtheria	Toxic substance related illness
Leprosy	Trichinosis
Leptospirosis	Typhus, flea-borne
Ophthalmia neonatorum	Waterborne outbreaks
Phenylketonuria	Yellow fever
Plague	

One case - Only one case was reported of actinomycosis, infant botulism, brucellosis, Guillain-Barre Syndrome, and lymphogranuloma venereum.

Two cases - Two cases of tetanus, toxic shock syndrome, and tularemia were reported. One person with tularemia was known to have handled rabbits. One persons with tetanus died.

Chancroid - Five cases of chancroid were reported, two of whom were age 15-19, one age 20-24, one 50+, and one age unknown. Three of the cases were male, one female, and one sex unknown. One was white, three nonwhite, and one race unknown.

Granuloma inguinale - The four reported cases of granuloma inguinale had the following age distribution: one 20-24, two 25-29, and one 35-39. Three were male and one was female. All four cases were nonwhite.

Histoplasmosis - Seven cases of histoplasmosis were reported in 1988; three of whom died. The cases were all over the age of 20. The mean age was 42.6. Four cases were white, two black, and one unreported race. All seven cases were male. Four cases resided in the Eastern Region, two in the Northern, and one in the Northwest Region.

Jakob-Creutzfeldt Disease - Three cases were reported, with two associated deaths. All cases were over the age of 50. Two were from the Central Region and one from the Northern. All three were white males. This disease is not reportable.

Listeriosis - Although this disease was not officially reportable in 1988, seven case reports of listeriosis were received. Four were identified as meningitis and are included in the bacterial meningitis summary. The other three were all females, one an infant, one in her eighties and one

age unknown. The cases were all from different regions of the state (one each from the Eastern, Northern, and Northwest Regions).

Nocardiosis - The ages of the seven reported cases ranged from 38 to 84 and averaged 64.3 years. Two cases were white. The race of the other five was not reported. Five cases were female and two were male. The Southwest Region reported the most cases (4), followed by Eastern (2) and Northern (1). Four of the cases occurred in the third quarter of the year. Each of the other quarters had one case. Nocardiosis is not officially reportable.

Rubella - Eleven cases of rubella occurred in Augusta County between March 30 and May 11, 1988. All eleven cases lived together and were members of a religious group who were opposed to immunization. No other cases were reported.

Toxoplasmosis - Four cases were reported with the following demographic distribution: age range 32 - 40; race - two white, one black, one unknown; sex - three male, one female; region - two Northern, two Eastern. Three persons died. Toxoplasmosis is not officially reportable.

Vibrio infections - Seven cases were reported, including one death. V. parahaemolyticus caused three of the infections, V. vulnificus caused two, and V. cholerae (non-01) caused two. Three cases were reported from the Eastern Region, two from the Southwest, and one each from the Northwest and Northern Regions.

